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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,074	11/28/2001	Jesse S. Lerman	DIVA/305	1112
26291	7590	11/24/2004	EXAMINER	
MOSER, PATTERSON & SHERIDAN L.L.P. 595 SHREWSBURY AVE, STE 100 FIRST FLOOR SHREWSBURY, NJ 07702			WILSON, YOLANDA L	
			ART UNIT	PAPER NUMBER
			2113	

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996,074

Applicant(s)

LERMAN ET AL.

Examiner

Yolanda Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 20-30 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-18, 20-30 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,3,4,10,11 are rejected under 35 U.S.C. 102(b) as being anticipated by Birk (USPN 5592612A). As per claim 1, Birk discloses accessing content data on an extent-by-extent basis from a plurality of disk drives configured in an array; streaming the content data to the plurality of subscribers on an extent-by-extent basis, sequentially, from the plurality of disk drives in column 5, lines 45-67.

Birk discloses detecting an actual disk drive failure in column 9, lines 56-64. Birk discloses transitioning to a stream regeneration mode of operation comprising: reading the content data contemporaneously from all extents in a parity group associated with a failed disk drive in column 10, lines 20-29; regenerating a failed portion of the content data from a failed extent in the parity group corresponding to the failed disk drive; and streaming the content data in the parity group to the plurality of subscribers, extent-by-extent, immediately following the regenerating of the content data from the failed extent in the parity group in column 6, lines 5-40.

3. As per claim 2, Birk discloses disallowing content loads upon detecting the actual disk drive failure in column 8, line 63 – column 9, line 5.

4. As per claim 3, Birk discloses migrating at least one subscriber to a non-failed disk drive array in column 6, lines 5-40.

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5. As per claim 4, Birk discloses migrating content to a non-failed disk drive array in column 6, lines 5-40.
6. As per claim 10, Birk discloses the regenerating step further comprises initiating a data regeneration mode of operation comprising writing, as a low priority task, recovered content data to spare extents on non-failed disk drives in the array in column 6, lines 5-40.
7. As per claim 11, Birk discloses once the regenerated content data has been written to the spare extents, initiating a recovery-carousel-serving mode of operation comprising streaming psuedo-sequentially, extent-by-extent, content data of each parity group to the plurality of subscribers, here the regenerated content data in a spare extent of each parity group is streamed out of sequence in column 6, lines 5-40.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5-9, 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birk in view of Peters et al. (USPN 6415373). As appears in claim 5, Birk fails to explicitly state sensing installment of a replacement disk drive; and rebuilding the content data thereon.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to sense installment of a replacement disk drive and rebuilding the content data thereon. A person of ordinary skill in the art would have been motivated to sense installment of a replacement disk drive and rebuilding the content data thereon because a new disk drive allows the computer system to have faster access to the data on the drive with the data being restored on the new drive.

10. As per claim 6, Birk fails to explicitly state allowing content loads on the replacement disk drive.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow content loads on the replacement disk drive. A person of ordinary skill in the art would have been motivated to allow content loads on the replacement disk drive because the replacement drive is non-faulty; therefore, it can be used to store data.

11. As per claim 7, Birk discloses accessing the content data on an extent-by-extent basis from the plurality of disk drives configured in the RAID 5 format; and streaming the

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content data to the plurality of subscribers on an extent-by-extent basis, sequentially, from the plurality of disk drives in column 5, line 45 – column 6, line 34.

12. As per claim 8, Birk discloses load-balancing the content data between additional disk drive arrays in column 5, lines 29-31.

13. As per claim 9, Birk discloses load-balancing the streams to the plurality of subscribers between additional disk drive arrays in column 5, lines 10-23.

14. As per claim 12, Birk fails to explicitly state sensing installment of a replacement disk drive; and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to sense installment of a replacement disk drive and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive. A person of ordinary skill in the art would have been motivated to sense installment of a replacement disk drive and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive because a new disk drive allows the computer system to have faster access to the data on the drive with the data being restored on the new drive.

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15. As per claim 13, Birk discloses accessing content data on an extent-by-extent basis, sequentially, from the plurality of disk drives configured in the RAID 5 format; and streaming content data to the plurality of subscribers on an extent-by-extent basis, sequentially, from the plurality of disk drives in column 5, line 45 – column 6, line 34.

16. As per claim 14, Birk fails to explicitly state allowing content loads on the replacement disk drive.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow content loads on the replacement disk drive. A person of ordinary skill in the art would have been motivated to allow content loads on the replacement disk drive because the replacement drive is non-faulty; therefore, it can be used to store data.

17. As per claim 15, Birk discloses load-balancing the content data between additional disk drive arrays in column 5, lines 10-23.

18. As per claim 16, Birk discloses load-balancing the streams to the plurality of subscribers between additional disk drive arrays in column 5, lines 10-23.

19. Claims 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birk in view of Brady et al. (USPN 5727144). As per claim 17, Birk discloses accessing content data on an extent-by-extent basis from a plurality of disk drives configured in an

array; streaming the content data to the plurality of subscribers on an extent-by-extent basis, sequentially, from the plurality of disk drives in column 5, lines 45-67.

Birk discloses transitioning, in response to the detecting step, a recovery-carousel-serving mode of operation comprising: streaming psuedo-sequentially, extent-by-extent, content data of each parity group to the plurality of subscribers, where the regenerated content data in a spare extent of each parity group is streamed out of sequence in column 6, lines 5-40.

Birk also discloses wherein in an instance where the disk drive predicted to fail fails prior to said writing step, said method further comprises transitioning to a stream regeneration mode of operating comprising reading the content data contemporaneously from all extents in a parity group; regenerating a failed portion of the content data from a failed extent in the parity group corresponding to the failed disk drive; and streaming the content data in the parity group to the plurality of subscribers, extent-by-extent, immediately following the regenerating of the content data from the failed extent in the parity group in column 6, lines 5-40.

Brady et al. discloses predicting a disk drive failure; writing content data from a the disk drive predicted to fail to spare extents on non-failed disk drives in the array; detecting at least one of an actual failure and removal of the disk drive predicted to fail in column 4, lines 15-38. The removal of the disk drive predicted to fail is accessing the disk drive only for copyaway and removal from normal data access.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to predict a disk drive failure; writing content data from a

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the disk drive predicted to fail to spare extents on non-failed disk drives in the array; detecting at least one of an actual failure and removal of the disk drive predicted to fail.

A person of ordinary skill in the art would have been motivated to predict a disk drive failure; writing content data from a the disk drive predicted to fail to spare extents on non-failed disk drives in the array; detecting at least one of an actual failure and removal of the disk drive predicted to fail because the writing of data from the predicted disk drive allows the data to be accessed by the computer system before the disk drive fails.

20. As per claim 18, Birk fails to explicitly state monitoring disk drive performance data selected from the group consisting of a sufficiently high frequency of failed read attempts, a control signal produced by a disk failing, a thermal profile, a disk drive manufacturer detection software signal, and disk access times exceeding a predetermined threshold value.

Brady et al. discloses the limitation a control signal produced by a disk failing in column 4, lines 15-38.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a control signal produced by a disk failing. A person of ordinary skill in the art would have been motivated to have a control signal produced by a disk failing because the control signal allows the computer system to know when a disk drive is starting to fail.

21. As per claim 20, Birk discloses migrating at least one subscriber to a non-failed disk drive array in column 6, lines 5-40.

22. As per claim 21, Birk discloses migrating content to a non-failed disk drive array in column 6, lines 5-40.

23. As per claim 22, Birk fails to explicitly state disallowing content loads upon detecting the actual failure of the disk drive predicted to fail.

24. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birk in view of Brady et al. (USPN 5727144) in further view of Peters et al. As per claim 23, Birk and Brady et al. fail to explicitly state sensing installment of a replacement disk drive; and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to sense installment of a replacement disk drive and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive. A person of ordinary skill in the art would have been motivated to sense installment of a replacement disk drive and writing the regenerated content data from the spare extents on the non-failed disk drives of the array to the replacement disk drive because a new disk drive allows the computer system to have faster access to the data on the drive with the data being restored on the new drive.

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25. As per claim 24, Birk discloses accessing content data on an extent-by-extent basis, sequentially, from the plurality of disk drives configured in the RAID 5 format; and streaming content data to the plurality of subscribers on an extent-by-extent basis, sequentially, from the plurality of disk drives in column 5, line 45 – column 6, line 34.

26. As per claim 25, Birk and Brady et al. fail to explicitly state allowing content loads on the replacement disk drive.

Peters et al. discloses this limitation in column 15, lines 37-40, "After a storage unit fails, a new storage unit may be installed in its place, with lost data restored, or the lost data may be recreated and distributed over the remaining storage units."

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow content loads on the replacement disk drive. A person of ordinary skill in the art would have been motivated to allow content loads on the replacement disk drive because the replacement drive is non-faulty; therefore, it can be used to store data.

27. As per claim 26, Birk discloses load-balancing the content data between additional disk drive arrays in column 5, lines 29-31.

28. As per claim 27, Birk discloses load-balancing the streams to the plurality of subscribers between additional disk drive arrays in column 5, lines 29-31.

29. As per claim 28, Birk discloses forming said disk drives into a plurality of parity groups each parity group comprising contiguous data extents and a single parity extent striped across said disk drives wherein said data extents and parity extent of said parity groups are spatially distributed across the disk drives of said array column 6, lines 5-10.

30. As per claim 29, Birk discloses wherein each parity group further comprises a spare extent being spatially distributed across said disk drives of said array in column 7, lines 34-39.

31. As per claim 30, Birk discloses striping said data extents contiguously across a first portion of said disk drive of said array; forming said single parity extent in a disk drive adjacent to said data extents; and providing said spare extent in a disk drive of said array adjacent to said parity extent in column 6, lines 5-10 and in column 7, lines 34-39.

Response to Arguments

32. Applicant's arguments with respect to claims 1-18,20-27 have been considered but are moot in view of the new ground(s) of rejection. In view of the additional limitations added to 1,17 and the new claims 28-30, a new reference has been found to reject these claims, as indicated in the above rejection.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yolanda Wilson whose telephone number is (571) 272-3653. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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